

STIMULATING EFFECT OF SNAKES AND LADDERS GAME ON COGNITIVE AND FINE MOTOR SKILLS DEVELOPMENT OF PRESCHOOL CHILDREN

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ABSTRACT

The purpose of this study was to determine the effect of modified snakes and ladders game stimulation on cognitive and fine motor skills development in preschool children in Rejang Lebong Regency. The research method uses a Quasi experimental design with a two-group pre-posttest design. The results showed that in the intervention group cognitive development had a *P value* of 0.001 and fine motoric skills development had a *P value* of 0.00. This means there is a relationship between the stimulation of playing modified snakes and ladders with cognitive development and fine motoric skills of preschool children. Researchers concluded that there is a significant effect of stimulation of modified snakes and ladders games on cognitive abilities and fine motor skills of children aged 5-6 years.

Keywords: Cognitive Development, Fine Motor Skills Development, Preschool, Snakes and Ladders Game

INTRODUCTION

Preschool children are children whose age range is 3 to 6 years. The population of children aged 5-6 years in Indonesia reached 28.99%, in Bengkulu province amounted to 28.70% (Badan Pusat Statistik, 2024). In the preschool period, children's physical growth slows down but psychosocial and cognitive development increases. To see the development of children can be assessed from motor skills, social and emotional abilities, language skills and cognitive abilities (Prastiwi, 2019). WHO data shows that children under 5 years of age of male gender recorded 52.9 million experiencing developmental disorders where 95% of developmental disorders occur in countries that have low to middle income. The index development of Indonesian preschool children in the literacy aspect is 64.6%, the physical aspect is 97.8%, the social-emotional aspect is 69.9% and the learning aspect is 88%, meaning that the rate of growth and development disorders in Indonesia is still quite high (Kementerian Kesehatan Republik Indonesia, 2018).

Factors that can influence child development are family, psychological, cognitive, moral and spiritual experiences, school and community. In article 4 Standard 1 conducts stimulation to prepare the formation of attitudes, knowledge and skills of PAUD children (Kementerian Pendidikan dan Kebudayaan, 2014). Many learning methods can be applied for early childhood, one of which is learning by playing (Zaini, 2015). The snakes and ladders game can be a tools of improving children's developmental dimensions such as cognitive, language, social and fine motoric skills development.

During playing snakes and ladders, children throw dice and write number on the dice and count quickly and move to the box based on the numbers listed on the dice (Dewi et al., 2024).

Kusmaryati et al., (2023) said, there is an effect of playing snakes and ladders on child development. The snakes and ladders game affects the improvement of cognitive development of PAUD children where the ability to count 1 - 10 increased by 85% after the third intervention was given to (Falera et al., 2018). After the snakes and ladders game was carried out, there was an increase in fine motoric skills in children aged 5-6 years, the child could throw the ball in the ball box according to the provisions (Maryamah et al., 2024). Based on the initial survey that researchers conducted at *Khairul Umah's* Kindergarten and *Robirodyah's* Kindergarten, a modified snakes and ladders game had never been played and of the ten children who were assessed, 2 of them did not recognize numbers 1-10 and could not write their own names. This study aims to determine the effect of modified snakes and ladders game stimulation on cognitive development and fine motor skills of preschool children in Rejang Lebong region.

RESEARCH METHOD

Quasi-experiment is placing small groups into experimental and control groups. This research uses Quasi-experimental with a two-group pretest- posttest design. The population of this study were children attending kindergarten in Rejang Lebong Regency in 2024. The research sample was part of preschool children who attended *Robirodyah's* and *Khairul Umma's* Kindergarten, determining the sample using purposive sampling technique. Inclusion criteria: getting permission from parents, in good physical and mental health. Exclusion criteria: not registered in RR and KU kindergartens. Sample determination using a minimum sample of 30 interventions and 30 controls plus 10% *drop out* prediction sample. The study used parametric tests with independent t tests because the data were normally distributed.

RESULT

Table. 1
Frequency Distribution of Respondent Characteristics

Variables	Group		Total
	Intervention (n=30)	Control (n=30)	
Gender			
- Male	15 (50%)	15 (50%)	30 (50)
- Female	15 (50%)	15 (50%)	30 (50)
Order of children in the family			
- First	14 (46,7%)	15 (50%)	29 (48,3%)
- Second and so on	16 (53,3%)	15 (50%)	31 (51,7%)

Between the control and intervention groups, the gender of male and female respondents was equal at 15 people (50%). In both groups more than half were the second child and so on.

Table. 2
Distribution of Pre and Post Cognitive and Fine Motor Skills Development

Variables	Group		Total
	Intervention (n=30)	Control (n=30)	
Pre-cognitive development			
- Doubtful	11 (36,7%)	6 (20,0%)	17 (28,3%)
- Appropriate	19 (63,3%)	24 (80,0%)	43 (71,7%)
Pre-fine motor development	11 (36,7%)	16 (53,3%)	27 (45%)
- Doubtful	19 (63,3%)	14 (46,7%)	33 (55%)
- Appropriate			
Post cognitive development			
- Doubtful	1 (3,3%)	6 (20,0%)	7 (11,6%)
- Appropriate	29 (96,7%)	24 (80,0%)	53 (88,4%)
Post fine motor development			
- Doubtful	0 (0%)	16 (53,3%)	16 (16%)
- Appropriate	30 (100%)	14 (46,7%)	44 (74%)

Cognitive development pretest intervention group more than half 19 (63.3%) had appropriate development and in the posttest increased to almost all 29 (96.7%) appropriate. Whereas in the control group, the pre-test fine motor development of almost all 24 (80.0%) was appropriate and there was no increase in the post test. fine motor development of the intervention group in the pretest was more than half 19 (63.3%) appropriate in the posttest all 30 (100%) were appropriate. While the fine motor development of the control group pretest was more than half 16 (53.3%) doubtful and in the post, there was no improvement in fine motor skills development.

Table. 3
Data Normality Test

Variabel	Skewness	Standar Error	Nilai
Pre cognitive development of intervention and control groups	-0.840	0.309	- 2,718
Pre intervention and control group fine motor skills development	-1,837	0,309	-5,944

The skewness value minus the standard error in cognitive and fine motor development obtained a value of less than 2, meaning that the data is normally distributed, so the test used is an independent T test.

Table. 4
Mean Cognitive Development Before and After
Intervention in the Intervention and Control Groups

Variabels	Cognitive development		P value
	Before Intervention (mean,SD)	After intervention (mean, SD)	
Group Intervention	6,33 (0.802)	6.93 (0,365)	0,000
Group Control	1.80 (0.407)	1.80 (0,407)	1.000

There is a difference in the average cognitive development in the intervention group before and after modified snakes and ladders play therapy with a P value of 0.000.

Table. 5
Mean Fine Motor Development Before and After
Intervention in Intervention and Control Groups

Variabel	Fine motor development		P value
	Before Intervention (mean,SD)	After intervention (mean, SD)	
Intervention Group	1.53 (0.509)	3 (.000)	0,001
Control Group	1,47 (0,507)	1,53(0,507)	0,184

There is a difference in the average fine motor skills development in the intervention group before and after modified snakes and ladders play therapy with a P value of 0.001.

Table. 6
Mean Difference of Cognitive Development Before and After
Intervention in the Intervention and Control Groups

Variabel	Cognitif development		Difference mean (SD)	P value in group	P value between groups
	Before Intervention (mean,SD)	After Intervention (mean, SD)			
Intervention Group	6,33 (0.802)	6.93 (0,365)	1,47 (0,509)	0.001	0,01
Control Group	1.80 (0.407)	1.80 (0,407)	0,00 (0)	0,184	

The difference in the mean cognitive development of respondents after the intervention was 1.47 in the intervention group and there was no difference in the control group. With a P value of 0.001 between groups

Table. 7
Mean Difference of Fine Motor Development Before and After
Intervention in the Intervention and Control Groups

Variabel	Fine motor development		Difference mean (SD)	P value in group	P value between groups
	Before Intervention (mean,SD)	After Intervention (mean, SD)			
Intervention Group	1.53 (0.509)	3 (.000)	1,47 (0,509)	0.001	0,00
Control Group	1,47 (0,507)	1,53(0,507)	0,06 (0)	1,000	

The mean difference in fine motor development of respondents after the intervention was 1.41 in the intervention group with a p value of 0.000 between groups.

DISCUSSIONS

Characteristics of respondents based on gender between the control and intervention groups of male and female the same number, namely 15 (50%). One of the external factors that influence child development is gender (Isnainia & Na'imah, 2020). Herdyana (2019) there are differences in the developmental period between boys and girls at the age of 48 - 60 months, where 100% of boy respondents have normal

development while 18% of girls have questionable development. Munawaroh et al., (2019) said the incidence of delayed fine motor skills development in boys and girls is the same.

More than half of the children were second children and so on Zahara et al., (2023) there is a significant relationship between birth order or the position of children in the family on child development. The position of the child will affect the pattern of development of the child arranged and educated in the family (Zualichoh & Irdawati, 2020). Each child's position causes different responsibilities and consequences, this is due to different cultures and attitudes of parents. For this reason, we recognize the existence of only children, first-born children, middle children and youngest children.

There is a difference in the average cognitive development of children after stimulation playing modified snakes and ladders with a P value of less than 0.05, meaning there is a significant relationship. The snakes and ladders game has an influence and significance on cognitive development in early childhood (Amiliya & Dyah, 2019; Nurasiah et al., 2020). Many factors affect children's cognitive development such as providing stimulation in the form of education, parenting, playing methods, and patterns in learning (Kristina & Sari, 2021). Angkur et al., (2023), revealed that playing snakes and ladders can improve children's counting skills. Playing snakes and ladders can introduce children to number pictures consisting of numbers, and symbols say where there are stairs and snakes, when the child is at the beginning of the ladder, the child will recognize the addition symbol and when he is in the position of the snake's head the child will be told the symbol less.

There is a difference in the average fine motor skills development between before and after playing snakes and ladders where the p value is less than 0.05, meaning there is a significant relationship between stimulation of playing snakes and children's fine motor development (Melinda 2023), there is an influence on children's fine motor skills development after stimulation of playing modified snakes and ladders. When playing snakes and ladders, the child who throws the dice is asked to show with his finger and count the number of dots on the dice. If the position is at the beginning of the ladder, the child is asked to follow the path of the ladder, but if the child is in the position of the head of the ladder snake, the child is asked to go down to the tail of the snake and the group members who go down are given punishment by being trained how to write numbers and their own names and draw according to child development such as drawing people with complete limbs. Children who are stimulated or exercised will improve their children's fine motor skills.

CONCLUSION

There were equal numbers of males and females in the control and intervention groups. More than half of the children in the control and intervention groups were the second child and so on. There was an increase in the mean cognitive and fine motor skills development in the intervention group and there was no difference in the mean cognitive and fine motor. development in the control group. And there is a significant effect of modified snakes and ladders game on children's cognitive and fine motor development.

SUGGESTION

It is recommended to conduct research on all aspects of development with different interventions such as drawing and counting games.

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